

CLASSIFICATION CONFIDENTIALCENTRAL INTELLIGENCE AGENCY
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT

50X1-HUM

CD NO.

COUNTRY Poland

DATE OF
INFORMATION 1952SUBJECT Scientific - Chemistry, food preservation
Economic - Consumer goodsHOW
PUBLISHED Monthly periodical

DATE DIST. 26 Jan 1954

WHERE
PUBLISHED Warsaw

NO. OF PAGES 5

DATE
PUBLISHED Jan 1952

LANGUAGE Polish

SUPPLEMENT TO
REPORT NO.

THIS DOCUMENT CONTAINS INFORMATION AFFECTING THE NATIONAL DEFENSE
OF THE UNITED STATES, WITHIN THE MEANING OF TITLE 18, SECTIONS 793
AND 794, OF THE U.S. CODE, AS AMENDED. ITS TRANSMISSION OR REVE-
LATION OF ITS CONTENTS TO OR RECEIPT BY AN UNAUTHORIZED PERSON IS
PROHIBITED BY LAW. THE REPRODUCTION OF THIS FORM IS PROHIBITED.

THIS IS UNEVALUATED INFORMATION

SOURCE Przemysl Rolny i Spozywczy, Vol 6, No 1.NEW METHODS OF FOOD PRESERVATION IN POLAND

GENERAL

[The following report from Przemysl Rolny i Spozywczy gives some indication of new trends and methods of food preservation being considered by the Polish food-processing industry. Most of the new developments cited in the article are from Western sources. Only 9 of the 63 sources cited in the original article are from the USSR. The following is a summary of the more important methods discussed in the source.]

Poland's dynamic social transformation, with a continuous shift of population from rural to urban and industrial centers, necessitates a change in food processing methods. As industry develops, agriculture will also be placed on a higher technical level requiring less manpower. Agricultural produce will then be transformed by modern industrial methods into food products, 25-50 percent of which will be consumed in large public eating establishments.

The food industry in Poland faces an enormous task. Food processing must become a modern industry. In the Six-Year Plan, production in certain divisions of the milk industry will increase 400-800 percent, in the fats industry 200 percent, in the fermentation industry 160 percent, in the tobacco industry 117 percent, and in the sugar and confectionery industry 65 percent.

The modern organization of the farm products industry must consider agricultural zoning, the selection of proper seed, produce contracts, planters supplies, transportation, and storage. It must give attention to equipment, buildings, improved production methods, and work safety. Manpower must be housed and trained. Further, there are the problems of quality standards, nutritive values, and containers.

- 1 -

CLASSIFICATION CONFIDENTIAL

STATE	NAVY	NSRB	DISTRIBUTION																
ARMY	AIR	FBI																	

50X1-HUM

CONFIDENTIAL

The great task of preparing food standards requires an immense scientific and technical effort. In Poland, working out standards is one of the main tasks of the farm products industry. In the last 2 years, a number of central organizations of different branches of industry have been working on this problem. Their disconnected efforts have been unified recently by the PKN (Polski Komitet Normalizacyjny, Polish Standards Committee). The PKN took over the job of working out standards and created a number of commissions. The job has already been started and, with the research findings of Soviet specialists available to PKN commissions, should soon be completed.

This article will deal with recent technical advances in the food industry, and especially with new methods.

Food management on a nation-wide scale, food stockpiling, mass transport and storage, and food preparation on a large scale, all require proper food preservation.

Proper canning methods are especially important in perishable foods with a high water content such as meat, fish, milk, fruits, and vegetables. For an adequate supply of fruits and vegetables throughout the year, 50 percent of the crop ought to be preserved. The same applies in a smaller measure to milk and eggs, which are most plentiful in the late spring and summer. The preservation of the summer fish catch even for a few days would make it available to inland areas.

METHODS OF FOOD PRESERVATION

Preservation of Foodstuffs in Hermetic Containers

Thermal evacuation is one of the oldest and best known methods of food preservation. The purpose of thermal evacuation is to exclude the air and prevent strain on the container by expansion, while retaining an adequately small amount of pressure in the can after sealing and cooling. At a temperature of 70-80 degrees centigrade, only a small amount of air is left in the container and there is a minimal loss of Vitamin C. It is unfortunate that many factories in Poland do not properly appreciate this fact, so failure to exclude the air before sealing will reduce the nutritive value of the canned product and increase the possibility of spoilage.

There has been a world-wide effort to save metal, especially tin, in can construction. In 1936, tinplating by electrolysis was adopted with a three-fold saving in metal as compared with tinplating by immersion. There have also been attempts to adopt an alloy of silver and lead for sealing the side seams, or an alloy of 98 percent lead and 2 percent tin. Sanborn's experiment in 1943 and Cheftel's experiments have shown that this latter alloy gives better results than an alloy containing 65 percent lead. Lead is superior to tin, does not break down in the presence of tin, and can be used to solder side seams of tin cans.

Great savings in manpower, fuel, and materials have been obtained by using the continuous rolling process and the cold rolling mill in the manufacture of tin for cans.

Varnish has also become important in food preservation. It was formerly prepared from natural resins such as amber, copal, damar, and shellac; it is now produced from cellulose esters, condensation products of phenols, phthalic acid, and lactic acid. To prevent discoloration of certain canned vegetables such as beans and corn, a varnish with a small amount of tin oxide has been used.

- 1 -
CONFIDENTIAL

50X1-HUM

CONFIDENTIAL

Improved glass jars are now thinner and have simplified Mason-type tops. Mention should also be made of the Anchor, Soviet SKO, White Cap, and Soviet SKN, [Closures], which make feasible vacuum pack aging on an industrial scale.

The introduction in the 1930s of the cathode ray by Brasch and Land, used in the US in 1943 - 1946 for sterilizing food even in sealed cans, foreshadowed a new epoch in food preservation.

Storage conditions necessary to preserve vitamins in food in hermetically sealed containers should also be mentioned. Canned foods are best stored in cool dry warehouses. It is recommended that cold-storage warehouses, adequately dry, with a temperature not exceeding 10 degrees centigrade be constructed. Robinson reports that canned food stored at 12-13 degrees centigrade retain vitamin B₁ and vitamin C even after 6 months storage.

Preservation by Drying

This method has been used on a large scale in recent years. Of the various types of dryers used, vacuum-type dryers are undoubtedly the best. The amount of air used in the drying process is practically reduced to zero, since suction pumps are used to remove the moisture. This method of drying, known and used in industry for many years, deserves to be more widely used than previously. Poland's socialized and nationalized economy should consider quality first, even though immediate profits are low because of the high cost of equipment.

Trade journals have already mentioned construction of fruit and vegetable drying rooms with a concrete floor containing the thermal unit to dry the material by radiation. Irradiation (by infrared rays) would be even more effective if directed from above. The infrared rays penetrate the material and speed up the drying process. Also to be considered is the method of drying certain delicate fruits and vegetables by the blower (okiewowy) method in which inert gases, such as nitrogen, are employed.

Another interesting method of preservation is freeze drying, a further development of vacuum drying. It is especially important in drying various organic liquids and hormone, vitamin, and enzymatic preparation, and also in the preservation of bacterial cultures. Drying microorganisms in a frozen state does not kill the bacterial cells and permits their preservation in an unweakened physiological condition, even for a period of many years.

Preservation of Food by Freezing

This method has made great advances since 1930, when Minomaga developed contact freezing in multiple shelf freezers at from 20 to 30 degrees below zero centigrade. There have been many improvements in equipment and technology since that time but the basic problem is to remove the heat in a relatively short time.

Dehydrofreezing, an entirely new method, also called vacuum freezing, is especially advantageous because it permits the retention of vitamin C.

Methods of Juice Concentration

These methods have been very highly developed, permitting production of various concentrates which nearly retain the original properties of the fruit juice. These methods are especially adaptable to citrus juices, which are stored in a frozen condition after processing.

- 3 -

CONFIDENTIAL

50X1-HUM

CONFIDENTIALPreservation by Pickling

This method is especially suited for cucumbers and cabbage. Experiments in this field aim mainly to improve clarity during fermentation and extend the period of resistance to spoilage.

Experiments carried on by the SGOW (Szkoła Główna Gospodarstwa Wiejskiego, Main School of Rural Economy) Laboratories of Food Technology have shown that by adding small quantities of benzoic acid (0.04 percent), or an ester of para-hydroxybenzoic acid (0.03 percent), lactic acid fermentation in cabbage is not retarded, but the activity of yeast is suppressed. As a result, the final product, besides the normal amount of lactic acid, acetic acid, alcohol, etc., retains one to 2 percent of sugar, which normally is changed to products of alcohol fermentation by the action of the yeast in the cabbage. The one to 2 percent of sugar might be the carbohydrate reserve in pickled cabbage in spring, when increasing cold activity reduces acidity permitting the development of lactic acid fermentation bacteria or even rot bacteria.

By retaining sugar reserves, we may expect that the decreased acidity will be automatically offset by lactic acid bacteria, and that the product may be preserved until May or June instead of March. Later experiments in this direction seem to indicate that cabbage with reduced acidity retains active lactic acid bacteria, unrestrained in its development by the bacterial products (of antibiotic nature) resulting in reduced acidity.

Use of Electromagnetic Waves in Food Preservation

Preservation of food products by means of an electron current [The use of the cathode ray is mentioned in the first section dealing with hermetic containers in food preservation.] is the most important method being developed for microbe and enzyme destruction by means of waves and rays.

Electronic sterilization, which has since 1940 by the Massachusetts Institute of Technology and the Electronics Research Corporation [in English in original document] in Brooklyn, is accomplished by a powerful electronic generator in the form of a cathode tube. The results have been entirely satisfactory. This method is suitable for both pasteurization and sterilization. Electronic sterilization may in the future replace thermal sterilization, but not until research has proven that food subjected to electronic sterilization is entirely safe for human and animal consumption.

Research has shown that X rays are less effective in destroying bacteria than cathode rays, although the action of both types of rays is similar. In general, the effect of X rays on food is the same as that of cathode rays.

The infrared rays have recently stirred great interest among technologists and research in the field has been extensive. Many monographs have been written about the possibilities of technical use of these rays.

The use of infrared rays in the dehydration of food is increasing; they have also been used to cook bread and eggs.

Extensive research is being conducted on the use of ultraviolet rays in the preservation of liquid food products.

CONFIDENTIAL

CONFIDENTIAL

50X1-HUM

Packaging as a Factor in Helping to Preserve Food Products

Besides the great improvement in the manufacture of tin cans and glass jars, a great advance has been made in perfecting airtight containers of various plastic materials. Great interest is shown in "pliofilm," a Goodyear product. Other products for packaging are "alkathene," sold in the form of 0.88-millimeter flattened and rolled tubes of various sizes; "parakote," a rubber and wax product obtained from polymers such as polyvinyl chloride and cellulose acid; and "lamofilm," a paper glazed on both sides.

Chemical Preservatives

In many instances chemicals may be used in the preservation of food not adaptable to other means of preservation.

Much attention has been given in the last 12 years to esters of bromacetic acid, which in a 10-60 percent solution show a great capacity to suppress microorganisms, especially yeast.

In Belgium, a preparation representing a 60-percent solution of an ester of bromacetic acid, known as "G2," is being used; in Denmark, it is known as "Pandurool." Literature on the subject issued by a number of firms and experiments carried on in the SGCW Laboratories of Food Technology show that a dosage of 10 milligrams of the compound in question to one liter of product exerts a noticeable restraining influence on microbes, especially yeast, and a dosage of 50-100 milligrams to one liter will prevent renewed fermentation in such liquids as wine and beer.

This article was intended to point up a number of the more important advances in the technology of food preservation. General principles and the better known methods have been omitted. Poland must become aware of these advances and test a few of them in its food industry to achieve a fuller realization of the Six-Year Plan.

- E N D -

50X1-HUM

- 5 -

CONFIDENTIAL